Name	Score

Question 1:

a) What is a vector quantity? (1 mark)

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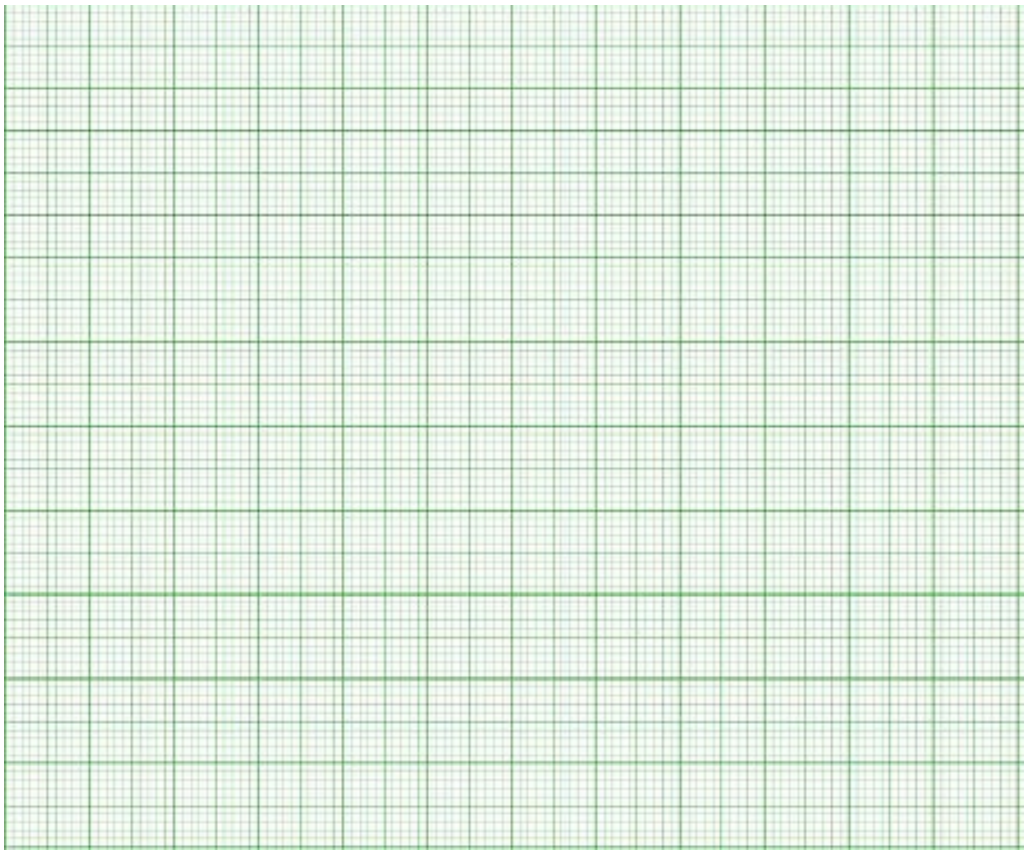
b) Give two examples of vector quantities (1 mark)

1. _____

2. _____

c) On the graph paper below plot the vector $\boldsymbol{v} = (\mathbf{3}, \mathbf{6})$ marking the magnitude and the angle (3 marks)



Question 2

A vector has the value $v = 8\angle 65^o$, calculate the x and y components (2 mark)

Question 3

Two displacement vectors are:

$$\vec{A} = \begin{bmatrix} 4 \\ 7 \end{bmatrix} \qquad \vec{B} = \begin{bmatrix} 6 \\ -2 \end{bmatrix}$$

Calculate $\vec{A} + \vec{B}$, show your workings (1 mark)

Question 4

A robot moves according to the following displacement vectors:

$$\vec{u} = \begin{bmatrix} 3 \\ -5 \end{bmatrix} \qquad \vec{v} = \begin{bmatrix} -2 \\ 8 \end{bmatrix} \qquad \vec{w} = \begin{bmatrix} 6 \\ 1 \end{bmatrix}$$

Calculate $\vec{u} + \vec{v} + \vec{w}$, show your workings (1 mark)

Question 5

Given:

$$\vec{P} = (9,4) \qquad \vec{Q} = (2,11)$$

Calculate $\vec{P} - \vec{Q}$, show your workings (1 mark)

Question 6

A drone moves:

$$16\angle 40^o$$

Then moves:

$$(-3,7)$$

Work out the total displacement of the drone in cartesian format, show your workings (2 marks)

Question 7

Calculate:

$$\begin{bmatrix} 4 & 7 \\ 2 & 9 \end{bmatrix} + \begin{bmatrix} 1 & 3 \\ 8 & 5 \end{bmatrix}$$

Show your workings (2 marks)

Question 8

Calculate:

$$\begin{bmatrix} 10 & 6 \\ 4 & 12 \end{bmatrix} - \begin{bmatrix} 3 & 9 \\ 7 & 2 \end{bmatrix}$$

Show your workings (2 marks)

Question 9

Calculate:

$$\begin{bmatrix} 2 & 5 & 1 \\ 7 & 3 & 4 \\ 6 & 8 & 9 \end{bmatrix} + \begin{bmatrix} 4 & 1 & 6 \\ 2 & 9 & 5 \\ 3 & 7 & 0 \end{bmatrix}$$

Show your workings (2 marks)

Question 10

Calculate:

$$\begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} 6 & 0 \\ 5 & 8 \end{bmatrix}$$

Show your workings (3 marks)

Question 11

Calculate:

$$\begin{bmatrix} 2 & 0 & 1 \\ 3 & 4 & 2 \\ 1 & 5 & 3 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 0 & 4 & 5 \\ 2 & 1 & 0 \end{bmatrix}$$

Show your workings (4 marks)